

What is claimed is:

1. A composition comprising colloidal Fe₃O₄ particles coated with a biotin-binding protein.
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2. A composition as claimed in claim 1 wherein the biotin-binding protein is avidin or streptavidin.
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3. A composition as claimed in claim 2 wherein the biotin-binding protein is streptavidin.
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4. A method for synthesis of a composition as claimed in claim 3, said method comprising the steps of incubating colloidal Fe₃O₄ particles with a biotin-binding protein.
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5. A method as claimed in claim 4, further comprising the steps of:
 - a) forming colloidal Fe₃O₄ particles by mixing aqueous FeCl₂ with aqueous FeCl₃ and adding aliquots of the mixture to an alkaline solution;
 - b) adding a biotin-binding protein.
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6. A method as claimed in claim 5, wherein the molar ratio of FeCl₂: FeCl₃ is between 1:1.5 and 1:2.
7. A method as claimed in claim 6, wherein the molar ratio of FeCl₂: FeCl₃ is 1:1.5.
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8. A method as claimed in claim 7, wherein the aqueous FeCl₂ is FeCl₂.4H₂O.
9. A method as claimed in claim 8, wherein the aqueous FeCl₃ is FeCl₃.6H₂O.
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10. A method as claimed in claim 9, wherein said forming step further includes adding an ammonia solution to the mixture of FeCl₂ and FeCl₃.

11. A method as claimed in claim 10, wherein the biotin-binding protein is added in excess.

5 12. A method as claimed in claim 11, wherein the biotin-binding protein is streptavidin.

13. A method of immobilising a biotinylated compound comprising incubating said biotinylated compound in solution in the presence of a composition as claimed in claim 1.

10 14. A method as claimed in claim 13, wherein the biotinylated compound is selected from the group consisting of a nucleic acid molecule, a protein, and a peptide.

15. A method as claimed in claim 14, further comprising the step of separating the biotinylated compound and the composition from said solution.

16. A method as claimed in claim 15, wherein said separating step further comprises the step of magnetically attracting the biotinylated compound and the composition to a surface.